

Notice of Allowability

Application No.

10/533,777

Applicant(s)

MIYAGI ET AL.

Examiner

Charles Chow

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/26/2007.
2. ☒ The allowed claim(s) is/are 2-4 and 8-14.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>5/3/2005</u> | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Detailed Action

1. This office action is for amendment filed on 4/25/2007.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance:

Claims 2-4, 8-14 are allowable over the prior art of record. The prior arts fail to teach the allowable features, singly, particularly, or in combination.

Applicant has amended the objected claims 8, 11 to be the independent claims based on the objected features & canceled claims 1, 5-7 [pages 9-10 of applicant's amendment].

The dependent claims 2-4, 9-10, 12-14 are also allowable due to their dependency upon the allowable independent claims above and the having additional claimed features.

The prior arts fail to teach the combined features, in below, for the antenna tuning with the temperature coefficients inside the digital to analog converter,

the device constant of the temperature coefficient setting section as a whole is changed in according with ambient temperature & the component elements are formed on the same substrate;

the plurality of different resistance formed by semiconductor manufacturing process,

the current source flows into temperature coefficient setting section, in the independent claims 8, 11, for a receiver of double conversion system comprising:

a control section for setting the frequency of the local oscillation signal outputted from said local oscillator, and for generating a frequency setting data required for associating the tuning frequency of said antenna tuning circuit with the frequency of the local oscillator signal, and for inputting the frequency setting data to said digital-analog converter,

wherein said digital-analog converter comprises a temperature coefficient setting section constituted by including elements having predetermined temperature coefficients,

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wherein the device constant of said temperature coefficient setting section as whole is changed in according with ambient temperature,

wherein said digital-analog converter, said high frequency amplification circuit, said first and second mixing circuits, said detecting circuit and said local oscillator are formed on a same semiconductor substrate [common portion],

wherein said temperature coefficient setting section includes a plurality of resistance which are formed by semiconductor manufacturing process and which have temperature coefficients different to each other, and

wherein a connection form of said plurality of resistances is set so that a temperature coefficient of said digital-analog converter reaches a predetermined value [in claim 8];

together with, the wherein said digital-analog converter comprises: a current source of which current value is set in according with a value of said inputted frequency setting data; and said temperature coefficient setting section into which the current generated by the current source flows, and wherein a voltage across said temperature coefficient setting section is outputted as said control voltage [in claim 11].

The closest prior art, **Nagata [US 4,491,978]**, teaches the antenna tuning circuit with variable capacitor 102 [col. 3, lines 2-11], for the double conversion [col. 3, lines16-36]; discriminator 116 & decoder 118 detected the output of the second mixer 112 via filter 114, amplifier 115 [col. 3, lines 37-56], but fails to teach the variable capacitance diode for antenna tuning, the antenna tuning with the temperature coefficients & tune data setting of a digital to analog converter, to be changed as a whole, for the elements formed on the same substrate; the plurality of different resistance formed by semiconductor manufacturing process, the current source flows into temperature coefficient setting section.

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Gaskill [US 5,301,358] teaches the varactors diode 24, 30 in Fig. 2 is for antenna tuning via signal Vcap from D/A converter 42 in controller 16, col. 4, lines 13-57], to automatically maximize the RSSI by tuning the antenna receiving frequency [col. 3, lines 3-20], but fails to teach the antenna tuning with the temperature coefficients & tune data setting of a digital to analog converter, to be changed as a whole, for the elements formed on the same substrate; the plurality of different resistance formed by semiconductor manufacturing process, the current source flows into temperature coefficient setting section.

Other prior arts in below are also considered, but they fail to teach the above allowable features.

Osburn et al. [US 5,428,829] teaches the ambient temperature compensation via Vd for the compensated digital-to-analog D/A converter 136 output voltage 82 for the antenna tuning in Fig. 3b, Fig. 1, equation (1) & col. 7, lines 27-36 & col. 8, lines & col. 8, lines 11-50].

Salvi et al. [US 6,081,700] teaches the self tuning antenna via signal from controller 122 [Fig. 1, abstract] having varactor diode 104.

Kromer et al. [US 5,745,844] teaches the antenna tuning circuit 140 receiving tuning signal from controller 130 [Fig. 1-3, abstract].

Von Arx et al. [US 2002/0065,539 A1] teaches the controller 302 to tuning antenna via varactor 341 & D/A 342 [paragraph 0018].

Macnak et al. [US 4,862,516] teaches antenna tuning [Fig. 1-6, abstract] with D/A converter 34.

Other prior arts are also considered. They are: **Birleson et al. [US 7,079,195 B1]**, **Dunn, Jr. et al. [US 6,867,745 B2]**, **Van Voorhies [US 6,239,760 B1]**, **Yamamoto [US**

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6,795,128 B2], Henderson [US 2006/0145,918], McGinnn [US 2004/0116,091 A1], Rafter [US 4,326,296], Fujisawa et al.[US 2002/0107,054A1].

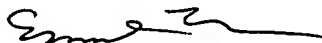
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow 

May 1, 2007.


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